

# Prescribing for **Seniors**

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# Goals of Prescribing

- ▶ lower pain/suffering/disability
- ▶ raise functional capacity
- ▶ promote quality of life
- ▶ prolong life



# *Therapeutic Planning*

- ▶ diagnosis
- ▶ non-drug treatment
- ▶ goals of treatment
- ▶ drug choice



# *Rx Principles for Seniors*

- ▷ know a few drugs well
- ▷ try for drug-free baseline
- ▷ “*start low-go slow*”
- ▷ 1/3 - 1/2 dose



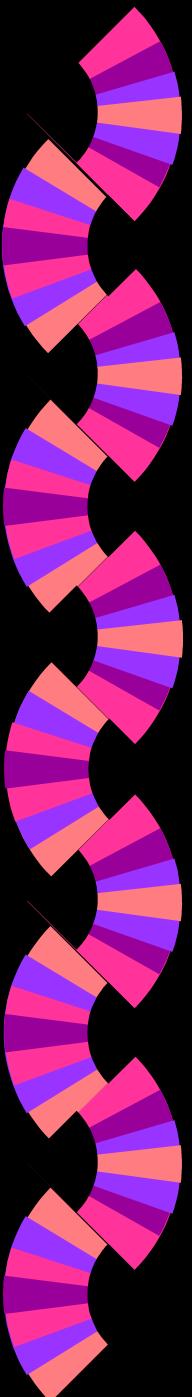
# *Rx Principles for Seniors*

- ▶ Simple, written plan
- ▶ ask patient to repeat instructions
- ▶ involve family
- ▶ label Rx purpose (...*for leg swelling*)
- ▶ bring meds to each visit (*brown bag*)



# *Risk of Adverse Drug Effects*

- ▶ decreased organ function
- ▶ altered pharm-kinetics/dynamics
- ▶ drug-drug interactions
- ▶ drug-disease interactions
- ▶ drug prescribing “cascade”



# *Geriatric Prescribing*

- ▷ 12% of US population
- ▷ 33% of Rx drugs
- ▷ 44% of NSAID Rx's



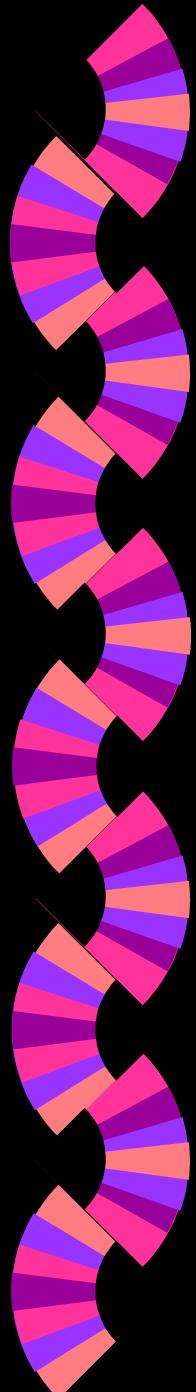
# *Pharmacokinetics*

- ▶ absorption
- ▶ distribution
- ▶ metabolism
- ▶ **excretion** (most important)



# *Absorption*

- ▷ least affected by aging
- ▷ similar bioavailability
- ▷ rising gastric pH affects some drugs
- ▷ drug-drug interactions more important



# *Distribution*

- ▶ lower lean body mass (digoxin)
- ▶ lower ECF volume (aminoglycoside)
- ▶ higher adiposity (benzodiazepine)
- ▶ protein binding



# *Metabolism*

- ▶ lower hepatic blood flow  
(lidocaine)
- ▶ oxidation/reduction/hydrolysis  
(CYP450)
- ▶ conjugation



# *Excretion*

- ▶ Cockroft-Gault formula for Renal function decline
- ▶ Cr clearance =  $(140\text{-age}) \times (\text{wgt Kg})$
- ▶  $\text{serum Cr} \times 72 \times 0.85$   
women)



# *Pharmacodynamics*

- Receptor sensitivity (beta blockers)
- drug-disease interactions



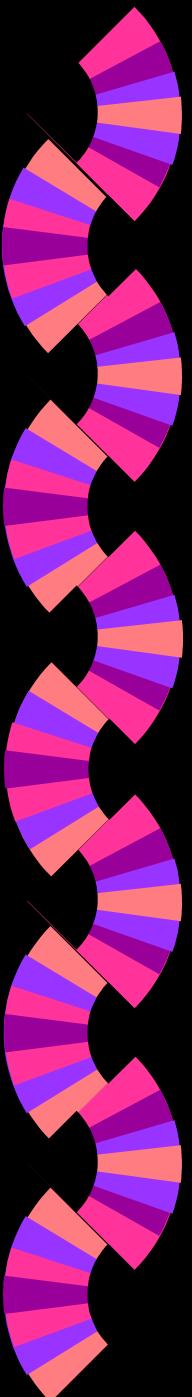
# *Polypharmacy*

- ▶ Risk of drug interactions
  - 2 drugs = ~6%
  - 5 drugs = ~50%
  - 8 drugs = ~100%

# *Cost Estimate Nursing Homes*

For each \$ spent on  
Rx...

\$ spent on  
complications of Rx



# *Polypharmacy*

- ▶ Study of 272 patients
  - 33% had 5+ meds
  - reductions advised 2/3
  - lower: costs, doses, Rx's



# *Polypharmacy*

- ▶ Study conclusions
  - prescriber education
  - simplify easier than D/C
  - patient education
  - provider communication



# *Brown Bag Check*

- ▷ OTC drugs
- ▷ vitamins
- ▷ minerals
- ▷ supplements
- ▷ Herbs



# *Over-the-Counter Drugs*

70% of patients use

- ▶ 30,000 available, 700+ ingredients
- ▶ women use = 2X men
- ▶ analgesics, nutritionals most used



# *Over the Counter Drugs* “Nutritional Supplements”

- no testing
- no identity standards
- no health claims...*technically*
- >\$10 billion annual market
- mythology: “not drugs” “safe”



# *Therapeutic Planning*

- ▶ Diagnosis
- ▶ treatment goal
- ▶ non-drug treatment
- ▶ drug Rx



# *Therapeutic Planning*

- ▶ Drug choice
  - efficacy
  - cost
  - ease of use
  - at-risk patient/safety



# *Therapeutic Planning*

- ▶ Single drug for multiple problems
  - alpha blocker for HTN & BPH
  - beta blocker for HTN & migraine
  - ACE inhibitor for HTN & CHF



# *Compliance*

- ▶ 40% inadequate
  - poor communication
  - low memory, vision, cognition
  - side effects
  - complex schedules
  - confusion as to purpose



# *Compliance*

- ▶ Written instructions = + ~30%
- ▶ easily understood, 4th Grade level
- ▶ use lay terms
- ▶ concise and specific
- ▶ label Rx purpose: “*for ankle swelling*”



# *Drug Interactions*

- ▶ Most important drugs:
  - warfarin
  - fluoroquinolones
  - anticonvulsants
  - HMG CoA's (statins)



# *Sildenafil (Viagra)*

- ▶ **Absolutely** contraindicated  
w/nitrates
- ▶ CYP4503A metabolized
- ▶ Caution: erythromycin, cimetidine,  
'conazoles, alpha blockers (4 hrs)
- ▶ start @ 25 mgm with above, or >65
- ▶ grapefruit juice inhibits P4503A4



# *Tadalafil (Cialis)*

- ▶ Phosphodiesterase 5 inhibitor
- ▶ low renal/hepatic fx = lo dose
- ▶ CYP3A4 ('conazoles, ritonavir)
- ▶ Contra: alpha-blockers, nitrates
- ▶ Tamsulosin (Flomax) OK



# Vardenafil

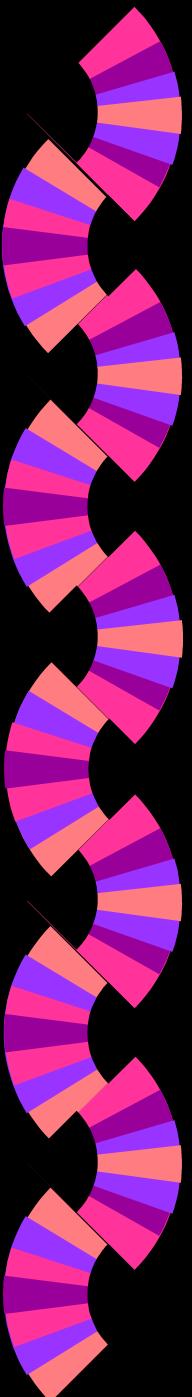
(*Levitra*)  
PDE5 inhibitor

- ▶ Lo dose in hepatic impairment
- ▶ Lo dose w/'conazoles, ritonavir, Indinavir, erythromycin
- ▶ Contra: nitrates, alpha blockers



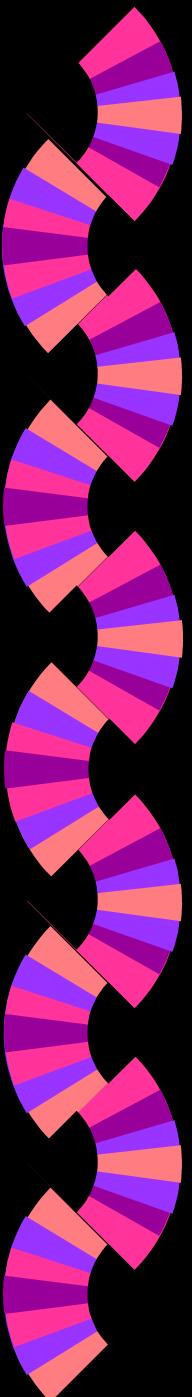
# *NSAIDs - over 65*

- ▶ ~80% have osteoarthritis,  
~1/2 severe
- ▶ Rx goals
  - improve function
  - reduce pain
  - ? Preserve joint



# *NSAIDs - over 65*

- ▶ ~40% of NSAID Rx's
- ▶ protein bound
  - levels rise w/low albumen
- ▶ primary hepatic metabolism
  - levels rise w/low hepatic blood flow
- ▶ NSAIDs = 1/4 of adverse drug events



# *NSAIDs - over 65*

- ▶ 1-4% have serious GI problem
- ▶ ~16,500 deaths/yr in osteo & rheumatoid arthritis patients
- ▶ most GI problems w/o warning
  - painless bleed



# *NSAID Risk Factors*

- ▶ Established:
  - advanced age (>75)
  - h/o ulcers
  - corticosteroid use
  - Hi-dose/multiple NSAIDs
  - serious systemic disease



# *NSAID Risk*

## *Factors*

Possible:

- cigarette smoking
- alcohol use
- *H. pylori* infection



# *Safe Rx for Elderly Arthritis*

- ▶ Analgesic choice:
  - pure analgesic (acetaminophen)
  - nonacetylated salicylate (salsalate)
  - safer NSAIDs (Cox 2)
  - NSAID + mifepristone
  - NSAID + proton pump inhibitor



# *Safe Rx for Elderly Arthritis*

## ► Renal risks:

- age
- diuretics
- renal disease (diabetes, HTN)



# *Safe Rx for Elderly Arthritis*

- ▶ Highest risk NSAIDs
  - flurbiprofen (Ansaid)
  - piroxicam (Fledene)
  - indomethacin (Indocin)
  - meclofenamate(Meclofenamate)
  - oxaprozin (Daypro)



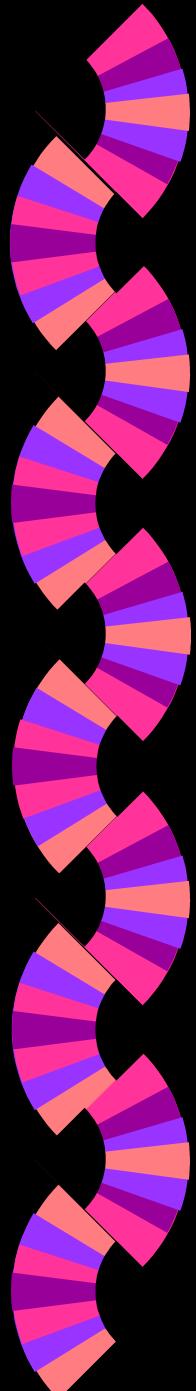
# *Safe Rx for Elderly Arthritis*

- ▶ Safer:
  - etodolac (*Lodine*)
  - nabumetone (*Relafen*)
  - salsalate (*Dilalsid*)
  - sulindac (*Clinoril*)
- ▶ All 4 OTC NSAIDs are medium-risk
  - ibuprofen, ketoprofen, ASA, and naproxen



# *Safe Rx for Elderly Arthritis*

- ▶ MAX local/non-medicinal Rx
- ▶ ID Hi-risk patients
- ▶ monitor carefully



# Cox-2 Inhibitors

- ▶ Relatively selective
  - etodolac (*Lodine*)
  - meloxicam (*Mobic*)
- ▶ Highly selective
  - celecoxib (*Celebrex*)
  - rofecoxib (*Vioxx*)



# Cox-2 Inhibitors

- ▶ Drug Interactions
  - **celecoxib** is CYP450-2C9 metabolized
  - may increase amiodarone, cimetidine, fluvastatin, omeprazole, zafirlukast
- ▶ Documented Interactions
  - **rofecoxib** with methotrexate, warfarin, rifampin
  - **celecoxib** with lithium, fluconazole



# *Cox-2 Inhibitors - Safety*

- ▶ No dose adjustment in elderly - use lowest
- ▶ contraindicated in ASA sensitivity
- ▶ **celecoxib** contraindicated in sulfa allergy
- ▶ Cox-2's may worsen HTN, edema (CHF)
- ▶ little antiplatelet effect - not protective
- ▶ but...with ETOH or anticoagulant, may increase bleeding



# *Cox-2 Inhibitors-----*

## *True or False?*

Arthritis patients on COX-2's can still get ulcers

- ▶ Peptic ulceration and bleeding doubles when ASA combined with COX-2's
- ▶ Patients on COX-2's may have more heart attacks than with older NSAID's



# *Cox-2's - Bottom Line*

- ▶ Cox-2's effect = older NSAIDs
- ▶ \$400,000 per 500 lo-risk patients to prevent *one* ulcer related complication
- ▶ 40 hi-risk patients to prevent one ulcer related complication (>75 yo, h/o ulcer)
- ▶ Cox-2 more cost effective in hi-risk than NSAID + mifepristone or PPI



# *DM Treatment Questions*

- ▶ Glitazones (*Actos*, etc) may precipitate heart failure due to plasma volume expansion
- ▶ metformin is not safe in renal failure
- ▶ Insulin & sulfonylureas reduce microvascular events
- ▶ metformin reduces macrovascular/CV events in obese diabetics (UKPDS)



*The Good,*

*The Bad,*

*and*

*The UGLY!*



# *The Good...*

- ▶ Beta blockers post MI
- ▶ ASA in seniors w/ MI & stroke risk
- ▶ ACE's in CHF (& spironolactone)
- ▶ warfarin in atrial fibrillation
- ▶ diuretic/ACE/betablockers - HTN



# *The Bad...*

- ▶ Propoxyphine (Darvon)
- ▶ meperidine (Demerol)
- ▶ long 1/2 life benzo's (diazepam)
- ▶ amitriptyline (Elavil)



# *The UGLY!*

- ▶ supplement w/side effects, no benefit
- ▶ Vitamin E for heart disease
- ▶ *Ginko biloba* for memory improvement
- ▶ multivits w/IRON
- ▶ ZINC in Hi doses (>15 mgm RDA)



# *10 Steps to reduce Polypharmacy*

- ▶ 1 Brown bag checks
- ▶ 2 generic names, learn class
- ▶ 3 know side effects
- ▶ 4 age changes pharmacodynamics/kinetics
- ▶ 5 ? Indications for drug Rx



# *10 Steps to reduce Polypharmacy*

- ▶ 6 stop drugs not helping
- ▶ 7 stop drugs w/o clear indication
- ▶ 8 switch to less toxic Rx
- ▶ 9 avoid prescribing “cascade”
- ▶ 10 “one disease, one drug, once a day”
- ▶ (Carlson, Perils of Polypharmacy,  
Geriatrics 1996)



# *Excellent Reference*

## Using Medications Appropriately in Older Adults

- ▶ Cynthia M Williams, CAPT, MC,  
USN
- ▶ American Family Physician, Vol  
66, #10, 15 November 2002, p  
1917

